CLAIMS

1. Aqueous microemulsion comprising a perfluorinated alkane sulphonic or carboxylic acid or salt thereof, a liquid fluorinated monomer comprising a cure-site and optionally an inert liquid and highly fluorinated hydrocarbon compound.

2. Aqueous microemulsion according to claim 1 wherein the perfluorinated alkane sulphonic or carboxylic acid or salt thereof corresponds to the following formula:

$(Y\text{-}R_f\text{-}Z)_n\text{-}M$ (I)

wherein Y represents Cl or F; R_f represents a linear or branched perfluorinated alkylene having 3 to 15 carbon atoms; Z represents COO^- or SO_3^- M represents a cation including monovalent and multivalent cations, and n corresponds to the valence of M.

3. Aqueous microemulsion according to claim 1 wherein said liquid fluorinated monomer is selected from the group of fluorinated vinyl ethers having one or more nitrile groups, fluorinated olefins having one or more nitrile groups, fluorinated olefins having one or more halogen atoms selected from the group consisting of chlorine, bromine and iodine, fluorinated vinyl ethers having one or more halogen atoms selected from the group consisting of chlorine, bromine and iodine and mixtures thereof.

4. Aqueous microemulsion according to claim 1 wherein the liquid fluorinated monomer corresponds to one of the following formulas:

$CF_2=CF\text{-}CF_2\text{-}O\text{-}R_f\text{-}CN$

$CF_2=CFO(CF_2)_lCN$

$CF_2=CFO[CF_2CF(CF_3)O]_g(CF_2)_vOCF(CF_3)CN$

$CF_2=CF[OCF_2CF(CF_3)]_kO(CF_2)_uCN$

wherein, l represents an integer of 2 to 12; g represents an integer of 0 to 4; k represents 1 or 2; v represents an integer of 0 to 6; u represents an integer of 1 to 6, R_f is a perfluoroalkylene or a bivalent perfluoroether group.

5. Aqueous microemulsion according to claim 1 wherein the inert liquid and highly fluorinated hydrocarbon compound comprises a perfluorinated hydrocarbon compound.

6. Method of making an aqueous micro-emulsion according to claim 1 comprising mixing together water, a perfluorinated alkane sulphonic or carboxylic acid or salt thereof, optionally an inert liquid and highly fluorinated hydrocarbon compound and a liquid fluorinated monomer having a cure-site.

7. Process of making a fluoropolymer capable of being cured to a fluoroelastomer, the process comprising an aqueous emulsion polymerization of one or more fluorinated monomers and one or more liquid fluorinated monomers having a cure-site, characterized in that at least part of the liquid fluorinated monomers is provided as an aqueous microemulsion as defined in claim 1 during at least the initial stage of the aqueous emulsion polymerization process.

8. Process according to claim 7 wherein at least 2 % by weight of the liquid fluorinated monomer having a cure-site based on the total weight of liquid fluorinated monomer having a cure-site is provided during the initial stage of the polymerization.

9. Process according to claim 7 wherein the polymerization is initiated with an initiator system selected from a combination of a fluoroaliphatic sulfinate and an oxidizing agent capable of oxidizing the sulfinate to a sulfonyl radical and a combination of a free radical initiator and a water soluble chloride salt.

10. Process according to claim 9 wherein the fluoropolymer is a perfluoropolymer and the initiator system and amount thereof is selected such that the amount of ionic end group in the resulting perfluoropolymer is such that the absorbance ratio determined by calculating the integrated peak intensity within the range of 1840 cm^{-1} – 1620 cm^{-1} to the integrated peak intensity in the range 2740 cm^{-1} – 2220 cm^{-1} in a Fourier transform infrared spectrum of the perfluoropolymer, is less than 0.1.

11. Process according to claim 7 further comprising the step of isolating the fluoropolymer from the aqueous dispersion obtained at the end of the polymerization process.

12. Process for making a curable fluoroelastomer composition comprising the steps of providing a fluoropolymer according to the process of claim 11 and mixing the fluoropolymer

with a cure composition comprising one or more compounds capable of effecting curing of the fluoropolymer through the cure site components contained in said fluoropolymer.

13. Process according to claim 12 wherein the cure composition further comprises a polyunsaturated coagent.

14. Process for making a fluoroelastomer comprising the steps of providing a curable fluoroelastomer composition according to the process as defined in claim 12 and curing the thus obtained curable fluoroelastomer composition.

15. A cured fluoropolymer derivable from curing a fluoropolymer comprising units deriving from a liquid fluorinated monomer having a cure-site, wherein the amount of organic components extractable from the cured fluoropolymer with perfluoro benzene during Soxhlet extraction for 20 h is less than 5% by weight based on the weight of the cured fluoropolymer.